

# Clinical Course Content As A Dynamic Variable In Supervision Of Medical Students

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## Citation

M Nilsson, S Pennbrant, K Nilsson, E Pilhammar, C Wenestam. *Clinical Course Content As A Dynamic Variable In Supervision Of Medical Students*. The Internet Journal of Medical Education. 2009 Volume 1 Number 2.

## Abstract

**Background** During clinical supervision, medical students are expected to gain experience through clinical work, with the support of their clinical supervisor. What each supervisor chooses to emphasize and considers important will have a decisive impact on students' understanding of what is content necessary to master in order to gain clinical skills. Therefore, in this study, the focus of attention is on what supervisors choose to emphasise during clinical supervision of fourth year medical students during a surgical course. **Method** An ethnographic approach was used, including a selective intermittent time mode, where observation and informal interviews were conducted. Twelve supervisors and nine medical students at a teaching hospital in Sweden participated. Field notes were made during observation; these were transcribed and analysed qualitatively. **Results** The analysis resulted in six topic areas describing what was emphasized during supervision. The topic areas were: 1) Identifying, collecting and combining information, 2) Problem-solving and decision-making, 3) Handling treatment of disease, 4) Practical skills and illustration of technical equipment, 5) Communicating with patients, and 6) Handling organisational demands. **Conclusions** The findings of this study show the existence of several areas that are focused on in supervision. In authentic clinical situations, these topic areas were intertwined and overlapped and often appeared simultaneously. The clinical situations were adjusted neither to the students' clinical experience nor to the needs of the students. Consequently, the students may find it difficult to determine what to learn and what to achieve during supervision. They may also find it difficult to understand the situations in the same way as their supervisors, because students focus on handling situations with a more theoretical and declarative approach to a larger extent than do their supervisors. The students therefore need supervisor support to develop and integrate theoretical knowledge. One conclusion that can be made is that supervisor awareness of students' understanding is of crucial significance for the effective supervision. Regarding the nature of the content chosen in supervised situations, research in other settings and specialties would be required to map and to determine a more general theory of what is focused during medical supervision.

## BACKGROUND

During clinical supervision, medical students are expected to integrate abstract theoretical knowledge with clinical practical applied knowledge and to gain clinical skills to prepare them for their future role as practitioners. Clinical skills includes, for example, disciplinary knowledge, technical skills, and professional and interpersonal attributes [1], and it is assumed that the student will acquire such skill when interacting with patients and/or managing clinical situations. Students are expected to interpret and resolve clinical problems, and the clinical supervisor has a significant role in supporting the student in this process. The explicit demands made by the supervisor in clinical situations highlight what is considered important during clinical supervision. What the supervisor focuses on is assumed to have a decisive impact on the student's growing understanding of what is necessary to learn and develop in

order to gain clinical experience. Therefore, in this study, our interest is centred on the content that the supervisor selects to focus upon in clinical supervision of fourth year medical students during a surgical course.

To understand experience-based development, the Dreyfus and Dreyfus model [2] has been applied in the field of health care education [3, 4]. This model shows that a person usually moves through several stages of conceptualizing their clinical task. It has also been found that a medical doctor's reasoning increasingly changes from a theoretical mode to a personal-experiential mode, as he or she gains experience in clinical work [5-7]. Consequently, the literature shows that a difference exists between a novice's and a more experienced doctor's way of using knowledge, as well as between their respective understanding of clinical situations [8].

Clinical practice is considered as "real life" by students and

provides essential motivation for them, and is also considered to have a favourable effect on their acquisition of disciplinary knowledge [9]. On the other hand, the transition from theoretical to applied knowledge and skills has been described as both difficult and burdensome for medical students [10, 11]. For example, students have reported difficulties in adapting to a more self-directed mode of learning [11, 12] a new teaching style [13], and in developing clinical reasoning [14]. Seabrook describes, in a longitudinal study, that medical students find clinical teaching to be more diffuse, unbounded and opportunistic compared with earlier theoretical classes where learning objectives and materials were experienced as being clearer [13].

To increase the readiness of students for clinical practice, medical schools have incorporated clinically oriented courses into pre-clerkship [14-16]. Such courses cover, for instance, preparing prescriptions, procedural skills, communication skills, taking history, physical examination and oral presentations [16]. Despite such courses, studies have shown that students continue to encounter difficulties when, for example, applying educational knowledge in practice or performing clinical procedures [16, 17]. Accordingly, it is important to describe the supervisor's focus in clinical practice in order to increase our understanding of medical students' learning in various situations.

## AIM OF THE STUDY

The aim of this study is to describe the supervisors' focus during their clinical supervision of undergraduate fourth year medical students attending a surgical course.

## METHOD

### DESIGN

Following an ethnographic approach, observations and informal interviews were used as the general data collection methods [18]. With a traditional ethnographic approach, the researcher invests considerable amounts of time in fieldwork. In this study, we adopt an ethnographic approach described by Jeffrey as a selective intermittent time mode, in which the key criterion is depth of study, entailing progressive focusing for a sustained period [19]. Data were analysed by identifying meaning patterns among similarities and differences [20] in what was identified as content during supervision.

Setting, realization and participants

In Sweden, all medical education takes place in state-governed public universities, and all clinical education is completed at university hospitals. The undergraduate medical education lasts for 11 semesters (5.5 years), at the end of which the student graduates with a master of medicine. To become a registered doctor, the student must also undergo clinical training, including 18 months of clinical work and studies after graduation. The supervision covered by this study took place at a surgical clinic in a university hospital in Sweden during 2004-2005. This university hospital is one of Europe's largest, and encompasses three separate hospital sites, including three separate Surgical Clinical Education Wards (CEW). The head of each department, the health care directors and the director of the medical school all granted permission to carry out the study and facilitated access to the ward and participants. The observations were carried out mainly during medical rounds (n=21). Observations were also carried out at surgical outpatient clinics (n=3), in operating rooms (n=2) and during clinical seminars (n=1). Data were collected on a total of 27 occasions during a four-month period (see Table I), and comprised about 100 hours of observations.

**Figure 1**

List of observations, participates, settings and observer.

Observation	Supervisor	Student	Setting	Observer
1	A	I	Surgical outpatient clinic, III*	SP
2	H	I	Surgical ward I	SP+MSN
3	H	I	CEW **I	SP
4	C	II	CEW II	SP
5	C	II	CEW II	SP
6	C	II	CEW II	SP
7	D	III	CEW III	SP
8	L	III	CEW III	SP
9	K	III	CEW III	SP
10	D	IV	CEW III	SP
11	D	IV	CEW III	SP
12	E	IV	CEW III	SP
13	E	V	CEW II	SP+MSN
14	E	V	CEW II	SP+MSN
15	E	V	CEW II	SP+MSN
16	F	VI	CEW I	MSN
17	F	VI	CEW I	MSN
18	G	VI	OR, II	MSN
19	H	VII	CEW I	MSN+SP
20	I	VII	CEW I	MSN
21	I	VII	CEW I	MSN
22	B	VIII	CEW II	MSN
23	B	VIII	OR, II	MSN
24	J	VIII	Practical lecture, II	MSN
24	E	IX	CEW II	MSN+SP
26	E	IX	CEW II	MSN+SP
27	E	IX	CEW II	MSN+SP

\* Hospital, I, II or III.

\*\* Clinical Education Ward

Field notes [18] were made according to a previously used model [21] including documentation of the setting, the participants, on the nature of their clinical education but also

on the attitudes of the participants and on the pedagogical/communicative atmosphere observed during supervision. To deepen and broaden our understanding of what had been observed, informal interviews were conducted during coffee breaks or at other occasions and were documented in the field notes. Informal interviewing was performed without any predetermined questions and was used as a form of validation to ascertain that the researcher had interpreted the situation in an acceptable way. More complete documentation from observations and informal interviews was noted immediately after the observations [18] and field notes were transcribed after each observation.

For this study, nine fourth year medical students (two male students and seven females, aged between 23 and 37), attending a surgical course during their second year of clinical practice (i.e. the fourth year of their education), volunteered to participate in this study after a general inquiry to all students in the course. When observing participating students in clinical practice, 12 different supervisors (surgeons) (Table II) were involved. Of the twelve supervisors, eleven were men. The supervisors' ages varied between 36 and 65 years. The distribution of ages and sexes of the participating students and supervisors was representative of the whole population of students and surgeons at the clinic.

**Figure 2**

Teachers age, clinical experience, title and experience as supervisor.

Code	Age (Year)	Clinical experience (Year)	Title	Years as clinical supervisors
A	58	32	Special Consultant	23
B	58	24	Special Consultant	23
C	64	30	Special Consultant	
D	65<	40	Special Consultant	*
			Professor	
E	42	18	Special Consultant	7
			Med. dr	
F	42	18	Special Consultant	6
			Med. dr	
G	36	9	Special Consultant	3
H	59	30	Special Consultant	30
I	50	26	Special Consultant	25
J	53	26	Special Consultant	10
			Associate professor	
K	55-65	*	Special Consultant	*
L	Ca 50	*	Special Consultant	*
			Director of studies	

\* The question was never asked

## ETHICAL CONSIDERATIONS

The participants were fully informed about the study. It was emphasized that participation was voluntary and that a participant could withdraw at any stage without any fear of repercussions. All participants gave their informed consent

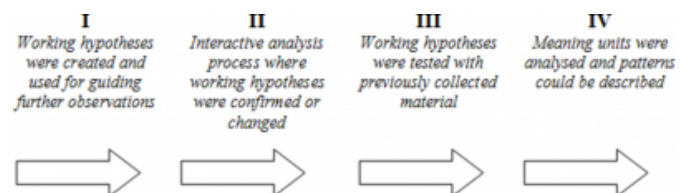
in accordance with the Declaration of Helsinki [22]. At the time when this study was planned and conducted, no approval by an ethics committee was required for this type of study. During some observations, patients were present. In such cases, the patient was informed of the purpose of the study and was assured that the researcher was bound by professional confidentiality.

## ANALYSIS

Data collection and data analysis were, according to the ethnographical tradition, conducted simultaneously. In figure 1, the analysis process is illustrated. It will be described in greater detail in the text below.

**Figure 3**

Description of the analysis process.



The first step of the analysis consisted of making analytic notes [18] about the area of focus by supervisors when interacting with the medical students. These analytic notes were used as working hypotheses, e.g. communication is identified as a focus or identifying data is identified as a focus and guided further observations (I). By applying an iterative process in which working hypotheses were used to make sense of data, and new data were used to confirm or change preliminary hypotheses, the analysis advanced [18] (II). The constant comparison with previously collected material, the understanding of the phenomena in focus was widened and deepened [23] (III).

The final step in the analysis was performed when all observations were complete. Meaning units, which represented the phenomena in focus, were detected in the data text (field notes) and given a code describing their content, e.g. judging clinical situations, identifying physical phenomena, treating patients, communicating with patients. These meaning units were used to build up patterns describing the focus in supervision. As the analysis advanced, the working hypotheses were given meaning and were reformulated, and when all text material had been analysed and consistency had been ensured, the final construction of the result was obtained (IV). The analysis was discussed within the research group until agreement was reached and six topic areas were identified.

## **RESULTS**

The results of the analysis will be presented together with examples from field notes which support the six topic areas described, namely:

Identifying, collecting and combining information

Problem-solving and decision-making

Handling treatment of disease

Practical skills and illustration of technical equipment

Communicating with patients, and

Handling organisational demands.

Some field notes are more extensively illustrated in Appendix I. The number indicates the observation situation (see Table I).

Identifying, collecting and combining information

A focus on identifying, collecting and combining information related to a clinical problem and situation was observed during supervision. Supervisors emphasized the importance of students using their educational knowledge, especially from pathology, anatomy and physiology, to perfect their diagnostic skills and ability to treat disease. Supervisors stated that excellent theoretical knowledge was a prerequisite for being able to formulate a preliminary judgment of a problem, and to be able to make use of information and practice medicine successfully. Consequently, students were encouraged to use their theoretical understanding to be able to identify, collect and combine information

....the supervisor states that the focus will be pathophysiological and stresses that the students must combine their basic educational knowledge with the patients' health situation. (19) (Field note A, Appendix I).

The importance of using theoretical knowledge was also underlined in the context of using information from referrals and/or medical reports (Field note B, Appendix I).

Supervisors emphasized the importance of the student's ability to identify what to focus on in a clinical situation, by using both theoretical and personal experience-based knowledge. The field note below illustrates the significance of making theoretical knowledge the point of departure when dealing with pain management

...The supervisor describes the basic principles of chronic pain conditions and points out that one should start with a theoretical image of the so-called "pain ladder". (2) (Field note C, Appendix I).

Supervisors encouraged students to read medical charts, as well as laboratory and examination results, in order to gather and combine information concerning the clinical situation. They also stressed the need of collecting data directly from the patient to fully understand the clinical situation. Students were directed to combine the impressions from meeting the unique patient or from the unique situation with other data

Supervisor: "Before making your mind up you better examine the patient to assess the condition". (6) (Field note D, Appendix I).

The necessity of using the senses (sight, hearing and touch) to identify, collect and combine data from patients was emphasized by supervisors. Consequently, the students were urged to use their senses to discern and identify information that could be used in problem-solving and decision-making.

The supervisor stresses that it is very important to look at, smell and touch the patient. It is not always important to take tests. The supervisor says that the students themselves are important instruments for assessing the patient's condition. (3)

Supervisors also highlighted evidence of the patient's condition, and explained the signs observed, in order to raise the student's awareness of the importance of identifying and collecting information through his or her own observations (Field note E, Appendix I).

## **PROBLEM-SOLVING AND DECISION-MAKING**

Problem-solving and decision-making were the most frequently observed topic areas during preparations prior to meeting patients, when the students were expected to solve medical problems in order to make a diagnosis or come to a decision. When solving medical problems, the students used information from medical reports, tests and nurses, together with information from the supervisors.

Supervisors encouraged students to reach a decision by applying a problem-solving approach. The students used both educational and clinical knowledge in their decision-making processes. By pointing out on what to focus and what to exclude, the supervisor guided the students in their problem-solving (Field note F, Appendix I). Sometimes supervisors demonstrated techniques used in solving a

particular problem, for example, in dialogue with the student or the nurse. Supervisors could, for example, ask the nurse for specific information and thereby demonstrate how to proceed in solving the problem. They also pointed out and described approaches useful in problem-solving, such as focusing solely on the medical problem or not prescribing unnecessary blood tests when these would not contribute to the choice of further actions. Supervisors underlined the use and value of scientific accounts for decision-making

Supervisor: “There is evidence that it heals better if he moves about, although not so that it hurts. (19) (Field note G, Appendix I).

### **HANDLING TREATMENT OF DISEASE**

Handling treatments of disease concerned the management of care and treatment during inpatient hospitalisation, as well as planning of future treatment. Supported by the supervisor, students were expected to make decisions regarding the treatment of patients during rounds. To handle such situations, students used both educational knowledge and propositional knowledge, describing rules and guiding principles. Supervisors also contributed propositional knowledge, e.g. rules concerning which blood tests are usually carried out under certain conditions, which liquids should be prescribed in postoperative care, or which examinations are most appropriate for certain conditions. Supervisors even quoted research results to support decisions concerning treatments.

Supervisors used concrete examples to illustrate how to deal with treatments and diseases. Such management was mostly based on the supervisor’s personal background and practical experience. The field note below describes when the supervisor demonstrates experience-based knowledge when explaining how to manage a clinical case.

During the sit-down round the supervisor identifies the most important blood tests. Supervisor: “For now, the electrolytes are the most important in this situation. Tomorrow we shall take Hb and EVF and then we shall monitor the fluid balance”. (16)

Supervisors also presented experience-based approaches used to decide on a patient’s treatments.

Supervisor: “It is not sure things will improve just because one fires away with major tests and measures, which could also frighten the patient completely needlessly”. (6)

Supervisors and students discussed routines and procedures,

such as how to manage certain conditions and illnesses, or how to manage specific clinical situations and how to support patients in their future care. The field note below shows a doctor providing examples of ways to manage a patient post-operatively

The supervisor joins the discussion and asks the student: “For how long should the patient be made to fast” The student does not answer the question but reflects: “The patient is not in pain...”/ The supervisor once again raises the matter of fasting and starvation during the round, when another patient’s prescriptions and continued treatment is being discussed. (21) (Field note H, Appendix I).

In the situations described above it was difficult to determine whether or not the knowledge content described by the supervisor was understood in the intended way by the student. In general, the student’s understanding of the content was rarely discussed during supervision.

### **PRACTICAL SKILLS AND ILLUSTRATION OF TECHNICAL EQUIPMENT**

The topic area of practical skills and illustration of technical equipment was observed when the student was encouraged to carry out practical, everyday tasks or to obtain practical understanding. Typical “how-to-do-tasks” were observed when students were given the possibility to practice something, e.g. perform an abdominal palpation, undertake a neurological examination, insert an intravenous catheter, draw blood from a vein or assist in the operating room. The example below is from a supervision situation in an operating room.

The student stands opposite the supervisor, who is operating. The student is holding retractors and keeping watch for sources of bleeding. So the student is participating very actively. The supervisor is teaching techniques on how the student should handle tissues. Supervisor: Do not wipe with the cloth, dab it up. The student listens and keeps assisting actively. (23) (Field note I, Appendix I).

When performing examinations, e.g. a rectoscopy, the student and the supervisor prepared the equipment and discussed the procedure before meeting the patient. Practical training was initiated either by the student or by the supervisor, and sometimes by the nurse. The medical students were often very eager to get the opportunity to improve their practical skills. They also often pointed out that they would have liked to receive more practical training during supervision (Field note J, Appendix I).

During supervision, students were given the opportunity to become acquainted with technical equipment and to discuss its practical use with their supervisor. During such demonstrations, in which patients were not involved, the supervisor demonstrated the approaches or techniques he or she used to accomplish a practical task. The dialogue below illustrates such supervision, where the supervisor shows how to carry out a practical task (here pleurocentesis) and what to bear in mind.

Supervisor says “It is better to enter with the peang [forceps] and feel with a finger so you get the right spot”. The student asks “How do you feel with the finger that you are inside?”. The supervisor answers “With the finger you know where you are”. The student wonders how he can do it without puncturing the wrong place and the supervisor says that “There is a risk it comes extrapleurally, as we don’t know how high the diaphragm is and that you have to enter it quite deep”. The student asks “How much is quite?” and gets the answer “A couple of decimetres. Just take it easy and then look at the chest x-ray”. (24) (Field note K, Appendix I).

The field note above also illustrates that it may be difficult for a supervisor to verbally transmit practical experience-based knowledge and to make it useful for the student.

### **COMMUNICATING WITH PATIENTS**

The students were expected to act as an attending doctor and to verbally communicate with the patient. Often before meeting the patient, supervisor and student together prepared for the doctor-patient meeting. Then the supervisor would ask the student questions such as: What are you going to tell the patient? What about notification of illness, the next visit, pain management, and the patient’s ability to handle his situation at home? The field note below illustrates how a supervisor focuses on suitable information (what he or she is going to say) in order to prepare the student for the meeting with the patient.

The nurse has pointed out that the spouse is worried that the patient [bedridden due to head trauma] will not take care of himself correctly. The supervisor asks the medical student: “What should one avoid after trauma to the head?”. The student considers the matter and quickly answers: “High pressure on the brain, ... activities?”. The supervisor concurs and adds: “Soft sounds and dimmed light, the brain needs peace and quiet, no TV-games”. Later during the rounds the student uses this knowledge when talking to the patient about how he should behave at home and the patient asks questions. (17)

Students were given opportunities to practice their communication skills. They were also given opportunities to encounter patients and to handle the consequences of their own communication. If the student appeared hesitant or helpless in communication, the supervisor would demonstrate what to say to and what to ask of the patient. Supervisors also pointed out the importance of good communication to obtain valid information from patients and that skills in this domain need to be practiced to develop. Communication was also described as an art that requires innate talent (Field note L, Appendix I).

Supervisors also commented on the manner in which students communicated. This happened, for instance, when a supervisor would underline the importance of the creation of a good relation and of informing the patient in a positive manner

Supervisor: “You started the discussion by talking about which pills are to be discontinued. Does this create a relationship? It is better to start by saying what we can do for the patient (19) (Field note M, Appendix I.).

### **HANDLING ORGANISATIONAL DEMANDS**

The topic of handling organisational demands covers situations and behaviours when the supervisors pointed out several ways to handle organisational circumstances, demands and limitations. Organisational demands and how they influence clinical judgments, in the form of restrictions and opportunities, were presented and discussed during supervision. Supervisors explained which patients or health-care conditions should be handled at the surgical clinic and which ones should be referred to other health care organisations or specialists. The field note below illustrates such a situation.

Supervisor: “The anamnesis is long. What can the problem be?”. Student: “A gynaecological inflammation, maybe other similar diagnoses”. Supervisor: “This is no longer a case for the hospital. It is an exploratory case. She should be discharged and further examination made”. (24) (Field note N, Appendix I).

Supervisors described organisational limitations, possibilities and prerequisites, such as available examinations, special routines at the clinic, staff qualifications and resources, or how the work is organized, that influence clinical management. In the field notes below the supervisor speaks of how to handle work in relation to time:

The supervisor ends the discussion, directs the attention to the next patient and notes that they are already 20 minutes late. “This would have been impossible if the students had had their own practice”. (1)

This is extended to include economic constraints.

The supervisor states that we cannot work miracles with the patients; we have to draw limits somewhere since this is an emergency ward and the hospital does not have limitless resources. (6)

Students were instructed on how to handle and enter medical records, make referrals and write prescriptions. Supervisors gave examples of what to focus on, and of what were obligatory and important to document and/or on how to draft a proper epicrisis (Field note O, Appendix I).

### **DISCUSSION**

This study presents what was focused on in supervision of fourth year undergraduate medical students at a surgical ward. By listening to what was said during supervision and observing actions and behaviours, it was possible to gain first-hand knowledge that was unfiltered by already existing concepts, operational definitions and rating scales [20, 24]. Based on this kind of direct and immediate knowledge, a description was made that could contribute to a more comprehensive understanding of medical clinical supervision.

This study was limited to supervision in surgical wards at one educational hospital in Sweden (including 2,300 beds), with a main focus on ward rounds, as limited observation was performed in other situations. To ensure credibility of the findings [25], the observers also questioned the participants in order to obtain their interpretation of what was observed. To ensure that the observations were interpreted and understood in a plausible way, they were documented thoroughly, with a co-participant observer, and then discussed within the research group as part of the analysis. To obtain direct and repeated affirmations of the observations, i.e. to ensure confirmability [25], the observations were made in several different wards and contexts, involving different participants. This made it possible to test working hypotheses in different settings and constellations.

The goal of qualitative research is not primarily to produce generalisations, but rather to make visible what has not been seen previously and to make in-depth descriptions of a

particular topic, which may function as a foundation for understanding, and knowledge of particular phenomena. The notion of transferability is used in qualitative research and refers to whether particular findings from one qualitative study can be transferred to a similar context or situation. Transferability criteria focus on general similarities of findings under similar environmental conditions, contexts or circumstances [25]. Therefore the study results cannot be generalized to all medical education, but can be transferred to similar contexts.

The findings of this study show the existence of several kinds of topic areas focused on in supervision. In the authentic clinical situations, these topic areas were intertwined and overlapping and often appeared simultaneously. The topic areas described should therefore not be seen as independent and separate entities, but as components of knowledge constituting the ongoing learning-teaching process. Handling and managing clinical situations were areas of focus during supervision, and all the areas described were essential to be able to take action and handle clinical situations. For example, in order to deal with the clinical situation, the student had to be able to identify, collect and combine information, as well as take into account organisational demands and communicate with patients, in order to know what to do, solve problems and make decisions. Organisational conditions determined the types of problems and situations students were expected to manage.

The clinical situations were therefore not adjusted to facilitate for a special learning situation. Consequently, the situations were adjusted neither to the students' clinical experience nor to their needs. During observations, there were signs that students may have felt unsure about what they were expected to pay attention to and learn. This relates to the findings of other studies describing uncertainty about expectations during clinical education [11]. Making this a student problem and leaving this process solely to the student could lead to misunderstandings among the students and to the educational representatives it may result in having limited control over students' learning outcomes. Furthermore, students who are not used to handling clinical problems might also find themselves suffering from much information overload [27]. Cognitively it may mean that the students may have difficulties discriminating between levels of importance regarding the information disseminated during supervision. Van Hall has described that such information overload could prevent students from using their previously acquired knowledge from pre-clinical classes [27].



More explicit learning goals adjusted to the students' clinical experience could therefore benefit supervision. If the medical education curriculum placed more focus on verbalising learning outcomes, planned learning activities, and on assessment criteria, i.e. constructive alignment [26], supervisors would probably be more able to help students understand what they are expected to learn and help them achieve this goal.

Traditionally, medical education has considered theoretical knowledge to be crucial for the development of clinical competence [1]. This study's findings confirm that this view prevails. Theoretical knowledge was the common ground used to identify and discuss medical problems, as well as, for example, communicative challenges, and it was used as a mutual ground for understanding by student and supervisor. Occasionally, supervisors were forced to help students when they lacked the necessary theoretical understanding for managing a clinical situation or problem. In such cases, the shared theoretical knowledge served as a starting point for helping the student understand the clinical situation and actions. This process has previously been described as a learning process unique to supervision [21], which can be seen as a specific learning process that takes effort and time. This process can only be achieved through dialogue with more experienced doctors in the context of clinical situations.

One may also consider whether the students in this study, after their first years of medical studies, are sufficiently qualified for integrating theoretical knowledge with practical clinical medicine in order to be able to effectively assimilate the clinical education during this surgery course.

The findings also show the significance of avoiding a dualistic view of practical experience and theoretical knowledge as two different entities in professional work [1]. The clinical experience has to be understood according to its nature [27]. An integration of theoretical knowledge and practical medical medicine from the beginning of the education may reduce the students' difficulties during the transition from theory to applied knowledge [10, 11]. Accordingly, support and sufficient time to develop and integrate theoretical knowledge are needed in order to make the clinical supervision effective for the students' acquisition of clinical understanding and skills. Therefore, educational establishments must develop their medical curriculum in a direction to facilitate the transition between theoretical studies and clinical studies, and medical teachers (in theoretical courses as well as in clinical courses) should

focus on supporting the student in this process.

The findings indicate that the students were dealing with a process of understanding and explaining clinical problems in the light of their theoretical understanding [14]. This approach is in accordance with a novice's way of reasoning [2]. The supervisors though were experts in their medical speciality and they frequently demonstrated both experience-based knowledge and experience-based approaches in order to handle clinical problems or situations [28]. Occasionally, supervisors found it difficult to describe their actions or their reasons for actions to students. A typical example of this is illustrated in the result by a field note describing how a supervisor demonstrates how to do a pleurocentesis.

### **CONCLUSION**

The supervisors have vast clinical experience and act as experts [2] in their profession as doctors. There is, however, an evident gap between supervisors and students in their ways of approaching the information/knowledge brought up as content during supervised sessions. The students as novices [2] in the field may find it difficult to understand the importance of the content chosen by their supervisors. Therefore, they may not completely take advantage of the fact that their supervisors by their selections offer not only a concrete patient close knowledge but also demonstrate a knowledge structure that could benefit their studies and their further professional development. The students seem to be left with their insufficient background knowledge acquired from lectures and the literature as they focus on handling situations with a more theoretical and declarative approach to a larger extent than do their supervisors. The supervisors need to increase the awareness of the students' relationships to the topic discussed and to look for divergences from the currently-accepted way of understanding it. This way, a supervisor's sensitivity will enable him or her to understand that the experience-based knowledge [28], clearly visible to the experienced doctor, is only partly or fragmentarily grasped by the students.

We recommend that that organization of supervision must be developed in such a way that:

The learning content presented during supervised sessions are related to learning goals and not exclusively related to organisational demands and the supervisors' personal preferences.

Supervisors' awareness regarding students' relationships to and familiarity with supervision content will be increased



The students are guided to determine what is crucial to learn in the clinical situation.

The supervisors have to balance demands in the learning situation to the students' clinical experience.

The supervisors declare students' expected learning outcomes. The supervisors should clearly point out the learning goal to the students in order to facilitate their understanding of what is expected of them.

Research in other settings and specialties would be required to determine a more general theory of what is focused on during medical supervision. In order to gain a more comprehensive understanding of the students' learning situation, further research is needed on the learning process of students in clinical settings.

### **COMPETING INTEREST**

The authors declare that they have no competing interests.

Authors' contribution

Maria Skyvell Nilsson (MSN), Sandra Pennbrant (SP) and Ewa Pilhammar (EP) have contributed to the design of the study. MSN and SP carried out the observations and the preliminary analysis of data. MSN and EP completed the final analysis. MSN wrote the first draft of the paper. MSN, Claes-Göran Wenestam (CGW), Kerstin Nilsson (KN) and EP contributed to the final version of the manuscript.

### **AUTHORS' INFORMATION**

Maria Skyvell Nilsson and Sandra Pennbrant have recently defended their PhD theses in Health Care Pedagogics.

Kerstin Nilsson is Associate Professor of Health Care Pedagogics and Vice Dean at the Sahlgrenska Academy. She has several years of experience of qualitative research methodology.

Claes-Göran Wenestam is Professor of Education at the University College of Kristianstad. He has several years of experience from research on learning and teaching in Higher Education and from the application of qualitative research methods.

Ewa Pilhammar is Professor of Health Care Pedagogics. She has several years of experience of studies relating to supervision and using qualitative research methods, for example ethnographic methods.

### **ACKNOWLEDGEMENTS**

The authors would like to thank all the participants for taking part in this study and Bo Samuelsson, MD, Professor, for his constructive advice and assistance in carrying out this project. The study was partly funded by the Västra Götaland Region in Sweden.

### **APPENDIX I.**

Illustration of field notes. These field notes representatively illustrate the topic areas and the number indicates the observation situation (see Table I).

Identifying, collecting and combining information

A) At the introduction during the sit-down rounds (without presence of the patient) the supervisor describes the clinical supervision period. The supervisor tells the students to read the course goals as regards surgery, in order to understand the purpose of the supervision. In addition, the supervisor states that the focus will be pathophysiological and stresses that the students must combine their basic educational knowledge with the patients' health situation. (19)

B) The students at the surgical ward have been given the lead responsibility for a patient. They are sitting in the doctors' lounge and reading the patient's referral papers sent from the local health centre and the patient's medical journal. (The students do this before they enter the examination room to meet the patient.) Using their theoretical knowledge, they think aloud, discuss and draw conclusions. Thereafter they discuss their conclusions and possible treatments for the patient with the supervisor. (10)

C) Student: "This patient is taking a lot of pain-relievers. It seems that medication has been added to medication. Are they all really needed?"

Supervisor: "What are your thoughts about this?"

### **THE STUDENT DISCUSSES THE SITUATION.**

The supervisor describes the basic principles of chronic pain conditions and points out that one should start with a theoretical image of the so-called "pain ladder". Perhaps the number of medications should be reduced, but this is a difficult task. It can take time and must be done in collaboration with the patient. (2)

D) Supervisor to student: "If you read through the text calmly, you will probably clarify the situation". The student reads the text again and says: "Ah, now I understand what it means". "Good", the supervisor says, "please tell me what

we should do with the patient". The student looks up and asks whether the patient is to go home today with the drainage. The student looks to the supervisor for an answer.

Supervisor: "Before making your mind up you better examine the patient to assess the condition". (6)

E) During the rounds the supervisor examines a patient with a fluid-filled abdomen. Supervisor: "Look [he then shakes the abdomen with his hand], do you see the wave-like movement in the abdomen? When you see this, there is a lot of fluid in the abdomen". (17)

### **PROBLEM-SOLVING AND DECISION-MAKING**

F) During the sit-down rounds the supervisor asks: "How long should the patient be made to fast?"

Student: "When did she arrive? Any pain?"

Supervisor: "There are intermediate possibilities. She may drink a little as we have no plans to operate. In this case it is more about how the patient feels, as we don't know what's wrong with her. She could have an ileus. We could let her drink and if she vomits she may have an ileus? Try it!" (21)

G) A patient has had a hernia operation and the student asks about the patient's ability for physical exercise. Supervisor: "There is evidence that it heals better if he moves about, although not so that it hurts. He should avoid pain in all cases". (19)

### **HANDLING TREATMENT OF DISEASE**

H) During a sit-down round the student, supervisor and nurse discuss the treatment of a patient with acute abdominal pains. The student asks the nurse "why is the patient kept on a fasting diet". The nurse provides an overview why the patient must not eat or drink. She says it is good for the patient to starve since this reduces the pain and nausea, which may improve the patient's condition. The supervisor joins the discussion and asks the student: "How long should the patient be kept on fast?" The student does not answer the question but reflects: "The patient is not in pain..."/ The supervisor once again raises the matter of fasting during the round, when another patient's prescriptions and continued treatment are being discussed. (21)

### **PRACTICAL SKILLS AND ILLUSTRATION OF TECHNICAL EQUIPMENT**

I) In the operating ward when the student comes from the clinical education ward to participate in an operation. The student has met and spoken with the patient and has

scrubbed his hands. The student stands opposite the supervisor, who is operating. The student is holding retractors and keeping watch for sources of bleeding. So the student is participating very actively. The supervisor is teaching techniques on how the student should handle tissues.

Supervisor: Do not wipe with the cloth, dab it up. The student listens and keeps assisting actively. After about 15 minutes of assisting, the student says: "It is amazing how quickly you get used to such a very strange situation". (23)

J) The supervisor asks the students if there is anything they would have liked to have more of during the period of practical clinical supervision. The students would have liked more practical, hands-on activities, e.g. placing a fixed catheter (urine catheter), a ventricular probe or a venflon - more nursing tasks. They have mostly ended up writing epicrisis. (12)

K) During the practical training the supervisor explains how one performs a pleura puncture. The supervisor shows how one can aspire and drain contents by using a three-way tap. Then the supervisor explains that the procedure requires two people to handle the tubes and one to take care of the patient. The supervisor shows with his fingers in the air how he manages emergency cases and says that "It is better to enter with the peang and feel with a finger to get the right spot". The student asks "How do you feel with the finger that you're inside?". The supervisor answers "With the finger you know where you are". The student wonders how he can do it without puncturing the wrong place and the supervisor says that "There is a risk it comes extrapleurally, as we don't know how high the diaphragm is and that you have to enter it quite deep". The student asks "How much is quite?" and gets the answer "A couple of decimetres. Just take it easy and then look at the chest x-ray". (24)

### **COMMUNICATING WITH PATIENTS**

L) The supervisor pointed out that not everyone has the gift of being able to get the essential information from the patient in an exact and efficient manner. (1)

M) Supervisor: "You [turning towards the student] started the discussion by talking about which pills are to be discontinued. Does this create a relationship? It is better to start by saying what we can do for the patient: 'We are going to give you nourishment and energy so you feel stronger'. Start with the positive items, start with offers instead of with restrictions". (19)

## **HANDLING ORGANISATIONAL DEMANDS**

N) During a sit-down round a patient with gynaecological problems is being discussed. Supervisor: "The anamnesis is long. What can the problem be?". Student: "A gynaecological inflammation, maybe other similar diagnoses". Supervisor: "This is no longer a case for the hospital. It is an exploratory case. She should be discharged and further examination made. This patient should not be in the hospital". (24)

O) Discussion between the supervisor and student during the sit-down round on how to fill out the medications list. The supervisor demonstrates the process and what to write in the different columns. (7)

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